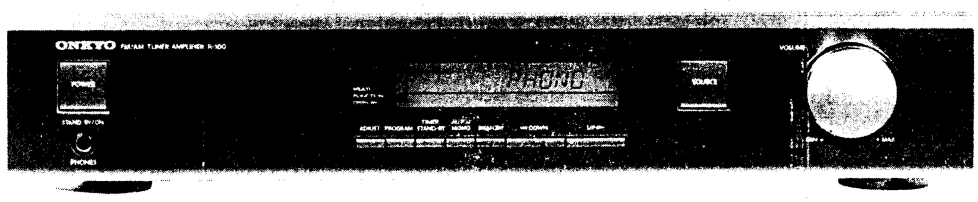
Ref. No. 3370

# ONKYO SERVICE MANUAL

## QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL R-100



| | |
|---|---|
| UG, UGV | 220V AC, 50Hz |
| UW | 120/220V AC, 50/60Hz |
| UQA, UQB | 240V AC, 50Hz |

**SAFETY-RELATED COMPONENT WARNING!!**
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

## TABLE OF CONTENTS


Specifications ..... 2
Service procedures ..... 2
Exploded view ..... 4
Parts list ..... 5
IC block diagrams and descriptions ..... 6
Adjustment procedures ..... 14
Disassembling procedures ..... 17
Printed circuit board parts list ..... 18
  Other pc boards ..... 18
  Tuner circuit pc board ..... 21
  Main amplifier pc board ..... 27
  Power supply circuit pc board ..... 28
Printed circuit board views ..... 19
  Other pc boards ..... 19
  Tuner circuit pc board ..... 21
  Main amplifier pc board ..... 27
  Power supply circuit pc board ..... 28
Schematic diagram –Tuner section– ..... 23
Schematic diagram –Amplifier section– ..... 25
Block diagram ..... 29
Packing view ..... 30


ONKYO
AUDIO COMPONENTS

**4. Change of FM/AM band step.**

With the exception of the UG and UQ models, a BAND STEP selector switch is not provided.

Refer the table as shown below when replace the band step frequency

(FM)

| BAND STEP | J718 | J719 |
|---|---|---|
| 200kHz→ 50kHz | short | open |
| 50kHz→200kHz | open | open |

(AM)

| BAND STEP | J717 |
|---|---|
| 10kHz→ 9kHz | short |
| 9kHz→10kHz | open |

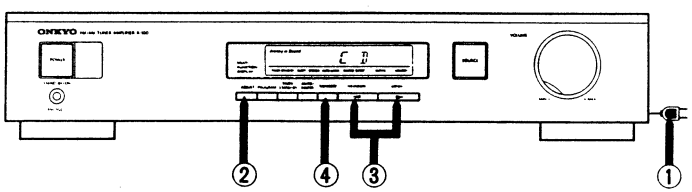
-Worldwide model-

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 200kHz and 10kHz depending on the area where the unit is used.

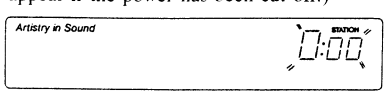
| | De-emphasis | FM step | AM step |
|---|---|---|---|
| Europe: | 50 μsec | 50kHz | 9kHz |
| U.S.A.: | 75 μsec | 200kHz | 10kHz |

**6. How to Set the Current Time**

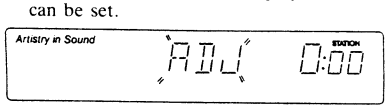
Make sure to adjust the time to the current time before setting the timer. Also do the same adjustment after a power failure has occurred or the power cord has been unplugged.




① Plug the power cord into a socket after making all of the necessary connections between components. "0:00" will flash on the display. (This will also appear if the power has been cut off.)

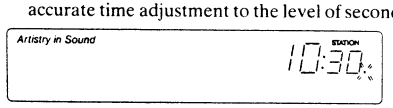



② Press the ADJUST button.
- "ADJ" will flash on the display, and the time can be set.

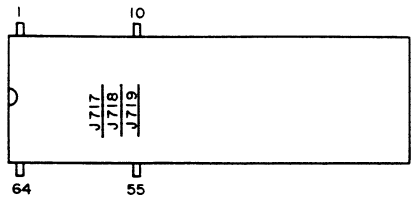



③ Adjust the time by pressing the UP ▶ or DOWN ◀ button.
- Each press of the UP ▶ or DOWN ◀ button increases or decreases the time by one minute. Pressing the buttons for more than 0.5 seconds changes the time fast. Pressing the buttons for more than 3 seconds changes the time even faster.
- The time is indicated in 24-hour display.

④ Press the MEMORY button.
- The ADJUST indicator goes out and the dots flash. The clock then starts. Pressing the MEMORY button according to an announcement of time on the radio or TV enables an accurate time adjustment to the level of second.




**NOTES:**
- The time setting can also be adjusted when the Power Switch is off.
- If you press the ADJUST button before pressing the MEMORY button will return you to the conditions present prior to setting the time.




**5. Safety-check out**

After correcting the original service problem perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power supply cord and terminal GND on the back panel. Specifications: more than 10MΩ at 500V.



# SPECIFICATIONS

**AMPLIFIER SECTION**

| | |
|---|---|
| Power Output: | 35 watts per channel, min. RMS, at 8 ohms, both channels driven, from 20Hz to 20kHz, with no more than 0.025% THD. |
| Musical Power Output: | 2×120 watts at 4 ohms, 1kHz (DIN)<br>2×70 watts at 8 ohms, 1kHz (DIN) |
| Continuous Power Output: | 2×60 watts at 4 ohms, 1kHz (DIN)<br>2×45 watts at 8 ohms, 1kHz (DIN) |
| Total Harmonic Distortion: | 0.025% at rated power<br>0.025% at 1 watt output |
| IM Distortion: | 0.025% at rated power<br>0.025% at 1 watt output |
| Damping Factor: | 55 at 8 ohms |
| Frequency Response: | 20 – 30,000Hz ± 0.5dB |
| RIAA Deviation: | 20 – 20,000Hz ± 0.5dB |
| Sensitivity and Impedance: | Phono: 2.5mV/50 kohms<br>CD/Tape Play: 150mV/50 kohms<br>TapeRec: 150mV/2.2 kohms (PHONO) |
| Phono Overload: | 120mV RMS at 1kHz, 0.025% THD |
| Signal-to-Noise Ratio: | Phono: 80dB (IHF A, 5mV input)<br>CD/Tape: 93dB (IHF A) |
| Tone : | BASS: ±12dB at 100Hz<br>TREBLE: ±12dB at 10kHz |
| Muting : | -∞ |

**TUNER SECTION**

**FM:**

| | | |
|---|---|---|
| Tuning Range: | 87.5 – 108.0 MHz (50kHz steps) | |
| Usable Sensitivity: | Mono: | 11.2dBf, 1.0μV, 75 ohms<br>0.9μV (S/N 26dB, 40kHz Devi.)<br>75 ohms DIN |
| | Stereo: | 18.0dBf, 2.2μV, 75 ohms<br>23μV (S/N 46dB, 40kHz Devi.)<br>75 ohms DIN |
| 50dB Quieting Sensitivity: | Mono: | 18.0dBf, 2.2μV, 75 ohms |
| | Stereo: | 37.2dBf, 20μV, 75 ohms |
| Capture Ratio: | 1.5dB | |
| Image Rejection Ratio: | 85dB | |
| IF Rejection Ratio: | 90dB | |
| Signal-to-Noise Ratio: | Mono: | 73dB |
| | Stereo: | 67dB |
| Selectivity: | 50dB DIN (±300kHz, 40kHz dev.) | |
| AM Suppression Ratio: | 50dB | |
| Harmonic Distortion: | Mono: | 0.15% |
| | Stereo: | 0.25% |
| Frequency response: | 30 – 15,000Hz ± 1.5dB | |
| Stereo Separation: | 45dB at 1kHz<br>30dB at 100 – 10,000Hz | |

**AM:**

| | |
|---|---|
| Tuning Range: | 522 – 1611kHz (9kHz steps) |
| Usable Sensitivity: | 30μV |
| Image Rejection Ratio: | 40dB |
| IF Rejection Ratio: | 40dB |
| Signal-to-Noise Ratio: | 40dB |
| Harmonic Distoriton: | 0.7% |

**GENERAL**

| | |
|---|---|
| Power Supply: | European models: AC220V, 50Hz<br>U.K & Australian models: AC 240V, 50H<br>Worldwide models: 120 and 220V switchal 50/60Hz |
| Dimensions (W×H×D): | 435×89×354mm |
| Weight: | 6.8 kg |
| Supplied Accessories | • Remote control transmitter RC-174S ×<br>• UM-3/R6/AA batteries × 2<br>• AM loop antenna × 1<br>• FM T-shaped antenna × 1 |

Specifications and features are subject to change without notice.

# SERVICE PROCEDURES

**1. Replacing the fuses**

For continued protection against fire hazard, replace only with same type and same rating fuse.

G (220V) model

| Circuit no. | Part no. | Description |
|---|---|---|
| F901 | 252071 | 1.25A-SE-EAK, Primary |
| F902 | 252074 | 2A-SE-EAK, AC outlet |

Q (240V) model

| Circuit no. | Part no. | Description |
|---|---|---|
| F901 | 252071 | 1.25A-SE-EAK, Primary |

W (Worldwide) model

| Circuit no. | Part no. | Description |
|---|---|---|
| F901 | 252049 | 4A (ST-6), Primary |
| F902 | 252071 | 1.25A-SE-EAK, Primary |

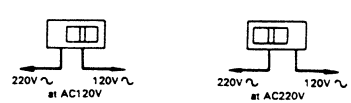
**2. Memory preservation**

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unpluggged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area whith an extremely humid climate.

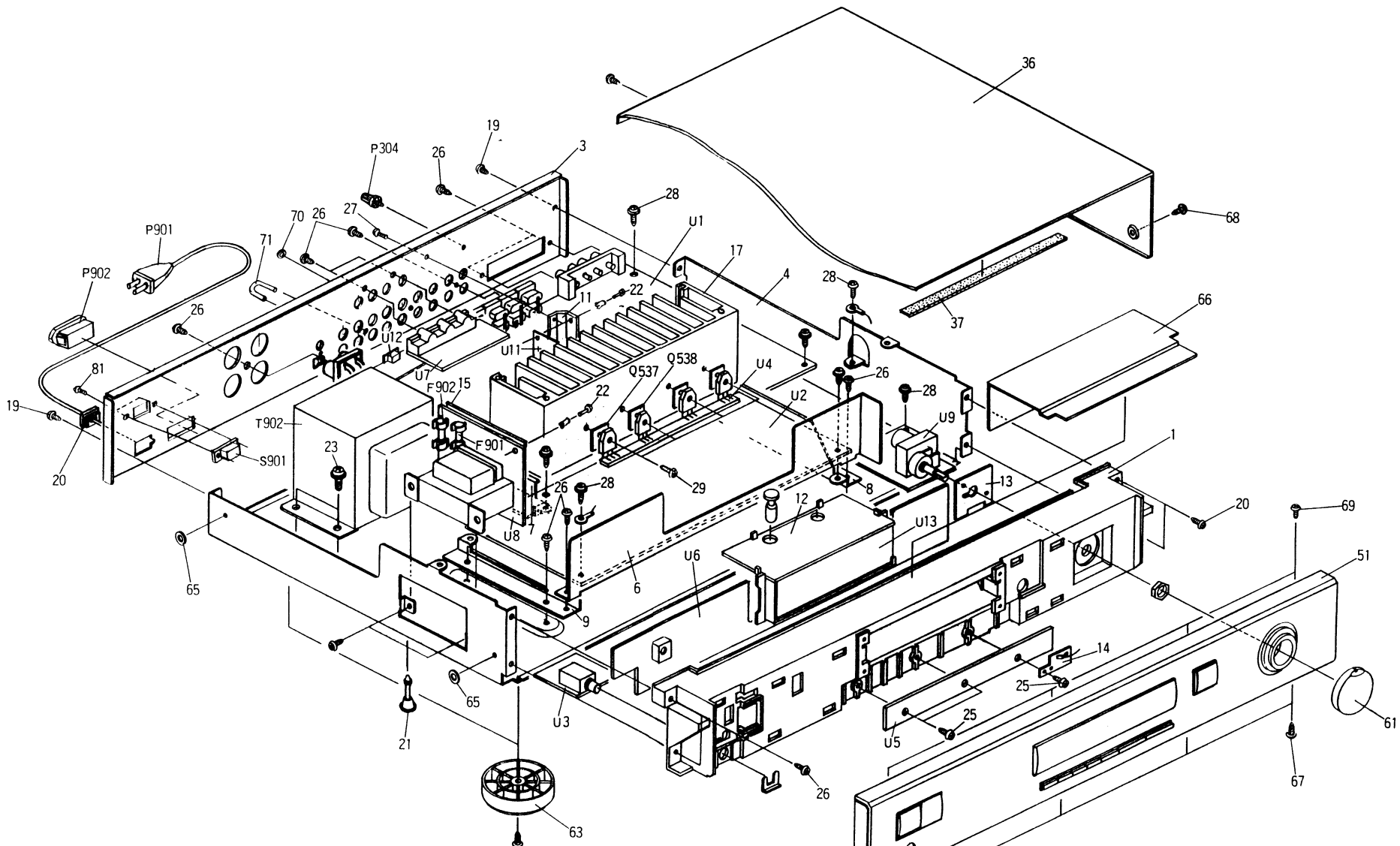
**3. Change of voltage**

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This switch is set to 220V at the factory, Voltage is changed by sliding the groove in the switch with the screw-driver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.



# EXPLODED VIEW



# PARTS LIST

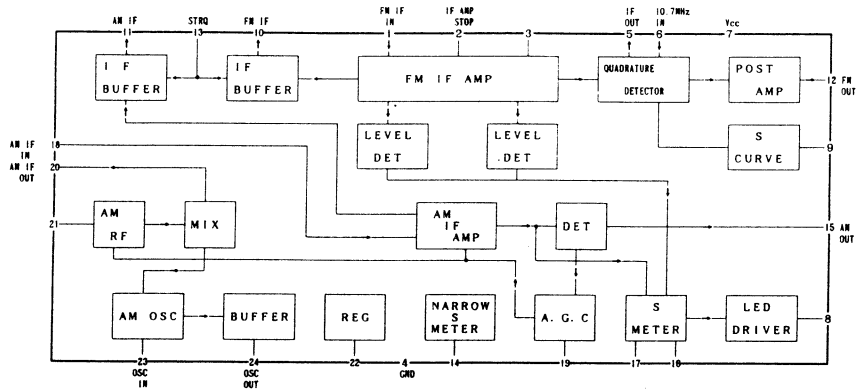
| REF.NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 27110546 | Front bracket |
| 3 | 27121351-1 | Back panel <G> |
| | 27121351-2 | Back panel <W> |
| | 27121351-3 | Back panel <Q> |
| 4 | 27100172-1 | Chassis |
| 6 | 27130605B | Bracket F |
| 7 | 27141286 | Bracket L |
| 8 | 27141287A | Bracket R |
| 9 | 27141288 | Bracket FL |
| 11 | 27141344 | Bracket EQ |
| 12 | 27225102 | Shield case LCD |
| 13 | 27150265A | Shield plate VR |
| 14 | 27150288 | Shield plate S |
| 15 | 28175161 | Insulated plate L |
| 17 | 27160233-2 | Radiator |
| 19 | 838430088 | 3TTB+8B(BC), Self-tapping screw |
| 20 | 27300750 | ⚠ Bushing(Strainrelief) |
| 21 | 27190511 | KGLS-16R, Holder |
| 22 | 880009 | NRP-345, Rivet |
| 23 | 830440089 | 4TTC+8C(BC), Self-tapping screw |
| 24 | 838440089 | 4TTB+8C(BC), Self-tapping screw |
| 25 | 833430088 | 3TTP+8P(BC), Self-tapping screw |
| 26 | 834430088 | 3TTS+8B(BC), Self-tapping screw |
| 27 | 82143006 | 3P+6FN(BC), Pan head screw |
| 28 | 831130088 | 3TTW+8B, Self-tapping screw |
| 29 | 801433 | 3SMS8W.SW+14B(BC), Sems tapping screw |
| 36 | 28184450-1 | Top cover |
| 37 | 28140720 | 0.5×10×150mm, Cushion |
| 51 | 1A214121 | Front panel ass'y |
| | 28125214A | End cap L |
| | 28125215A | End cap R |
| 61 | 28323941 | Knob, volume |
| 63 | 27175234A | Leg |
| 65 | 27270212 | Spacer |
| 66 | 28175168-1 | Insulated plate L |
| 67 | 833430080 | 3TTP+8P(BC), Self-tapping screw |
| 68 | 834430088 | 3TTS+8B(BC), Self-tapping screw |
| 69 | 838130108 | 3TTB+10B, Self-tapping screw |
| 70 | 27260146 | Spacer |
| 71 | 27141033 | Bracket, plug |
| 81 | 82142604 | 2.6P+4FN(BC), Pan head screw <W> |
| C902 | 3500077 | ⚠ 4700pF, 400V/125V, Capacitor IS <G/Q> |
| C902a | 27300601 | ⚠ Cover for C902 <G/Q> |
| C903 | 3500077 | ⚠ 4700pF, 400V/125V, Capacitor IS |
| C903a | 27300601 | ⚠ Cover for C903 |
| F901 | 252071 | ⚠ 1.25A-SE-EAK, Primary fuse <G/Q> |
| | 252049 | ⚠ 4A(ST-6), Primary fuse <W> |
| F902 | 252074 | ⚠ 2A-SE-EAK, AC outlet fuse <G> |
| | 252071 | ⚠ 1.25A-SE-EAK, Primary fuse <W> |
| P304 | 25060044 | Terminal, ground |
| P901 | 253149 | ⚠ AS-CEE, Power supply cord <G/W> |
| | 253118 | ⚠ AS-SAA, Power supply cord <Q> |
| P902 | 25050337 | ⚠ NSCT-2P164, AC outlet <G/W> |
| | 25050346 | ⚠ NSCT-2P173, AC outlet <Q> |
| Q537, Q538 | 2202253 or | 2SC4467-O or |
| | 2202254 | 2SC4467-Y, Power transistor |
| Q539, Q540 | 2202243 or | 2SA1694-O or |
| | 2202244 | 2SA1694-Y, Power transistor |
| S901 | 25065287 | ⚠ NSS-22113P, Voltage selector switch <W> |
| T902 | 2300542 | ⚠ NPT-1070G, Power transformer <G> |
| | 2300543A | ⚠ NPT-1070DG, Power transformer <W> |
| | 2300563 | ⚠ NPT-1070Q, Power transformer <Q> |
| U1 | 1A224513-2A | NARF-3813-2A, Tuner circuit pc board ass'y <G/Q> |
| | 1A224513-2B | NARF-3813-2B, Tuner circuit pc board ass'y <W> |
| U2 | 1A224514-2A | NAAF-3814-2A, Main amplifier pc board ass'y |
| U3 | 1A224515-2 | NAETC-3815-2, Headphone pc board ass'y |
| U4 | 1A224516-2 | NAETC-3816-2, Holder pc board ass'y |
| U5 | 1A224517-2 | NASW-3817-2, Operation switch pc board ass'y |
| U6 | 1A224518-2A | NADG-3818-2A, Digital circuit pc board ass'y <G/Q> |
| | 1A224518-2B | NADG-3818-2B, Digital circuit pc board ass'y <W> |
| U7 | 1A224519-2 | NAETC-3819-2, Video selector circuit pc board ass'y |
| U8 | 1A224520-2A | NAPS-3820-2A, Power supply circuit pc board ass'y <G> |
| | 1A224520-2B | NAPS-3820-2B, Power supply circuit pc board ass'y <W> |
| | 1A224520-2C | NAPS-3820-2C, Power supply circuit pc board ass'y <Q> |
| U9 | 1A224521-2 | NAETC-3821-2, Volume circuit pc board ass'y |
| U10 | 1A224522-2A | NAAF-3822-2A, Tone control pc board ass'y |
| U11 | 1A224523-2A | NAAF-3823-2A, Equalizer amplifier pc board ass'y |
| U12 | 1A224534-2 | NASW-3834-2, Band step pc board ass'y <W> |
| U13 | 24190020 | LTTAE6111A, LCD ass'y |

NOTE: <G>: Only 220V model
<W>: Only Worldwide model
<Q>: Only 240V model

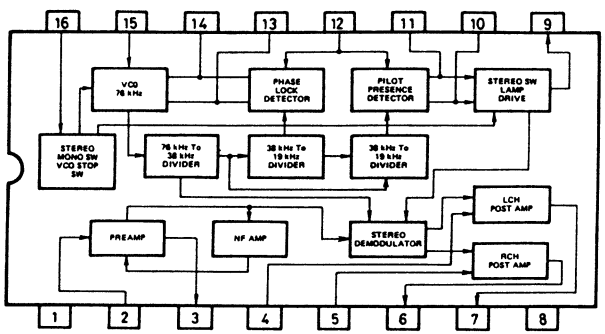
NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

# IC BLOCK DIAGRAMS AND DESCRIPTIONS

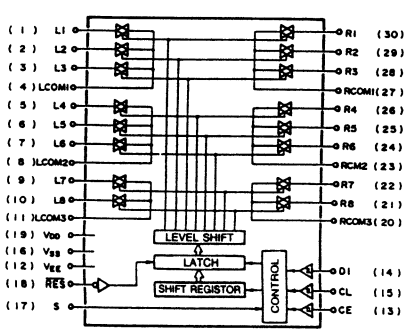
## Q103 LA1266 (FM IF and AM radio system)




## Q201
## AN7470 (FM stereo decoder)




## Q301 LC7822N (Analog Switch)




**Serial Data Compsition**

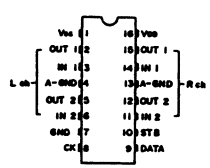
| A0 | A1 | A2 | A3 | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ADDRESS | | | | SWITCHES | | | | | | | |
| 0 | 0 | 1 | 1 | PHONO | CD | TUNER | VDP | TAPE PB | VCR PB | DIRECT | $\overline{\text{DIRECT}}$ |



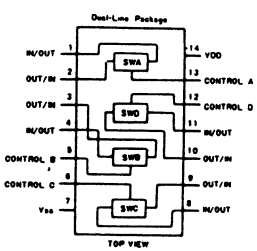


| Pin No. | Terminal | Description |
|---|---|---|
| 1 | PHONO | Input/output terminals for audio signal of the left channel.<br>Control to the inside analog switches at the serial data from the microprocessor. |
| 2 | CD | |
| 3 | TUNER | |
| 4 | L COMMON 1 | |
| 5 | VDP | |
| 6 | TAPE | |
| 7 | VCR | |
| 8 | L COMMON 2 | |
| 9 | $\overline{\text{DIRECT}}$ | |
| 10 | DIRECT | |
| 11 | L COMMON 3 | |
| 12 | $V_{EE}$ | Negative power supply terminal. (−15V). |
| 13 | CE | Chip enable terminal. Connect to the terminal SEL of the microporcessor μPD75108CW-B84. |
| 14 | DI | Serial data input terminal. Connect to the terminal DATA of the microprocessor. |
| 15 | CL | Serial clock input terminal. Connect to the terminal CLOCK of the microprocessor. |
| 16 | $V_{SS}$ | Ground terminal. |
| 17 | S | Selector terminal. |
| 18 | $\overline{\text{RES}}$ | Reset terminal. |
| 19 | $V_{DD}$ | Power supply terminal. (+5V) |
| 20 | R COMMON 3 | Input/output terminals for audio signal of the right channel.<br>Control the inside analog switches at the serial data from the microprocessor. |
| 21 | DIRECT | |
| 22 | $\overline{\text{DIRECT}}$ | |
| 23 | R COMMON 2 | |
| 24 | VCR | |
| 25 | TAPE | |
| 26 | VDP | |
| 27 | R COMMON 1 | |
| 28 | TUNER | |
| 29 | CD | |
| 30 | PHONO | |

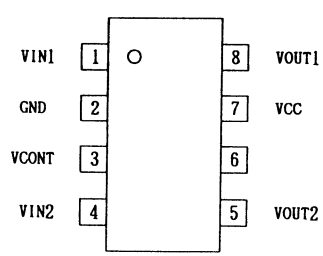
## Q302 TC9214P (Analog switch)




## Q251 4066B (Analog switch)



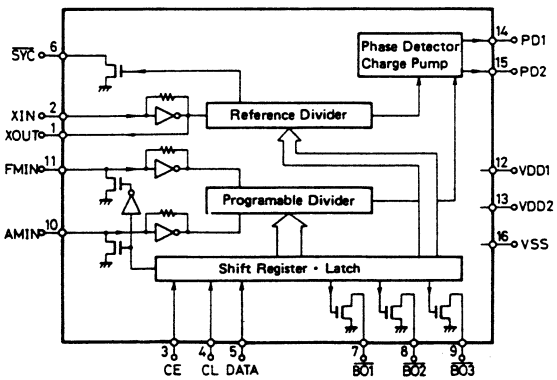

## Q391 LB1639 (Volume Motor Drive)




| #1 | #4 | #8 | #5 | |
|---|---|---|---|---|
| VIN1 | VIN2 | VOUT1 | VOUT2 | |
| H | L | H | L | Clockwise |
| L | H | L | H | Counterclockwise |
| H | H | OFF | OFF | Stop |
| L | L | OFF | OFF | Stop |

R-100

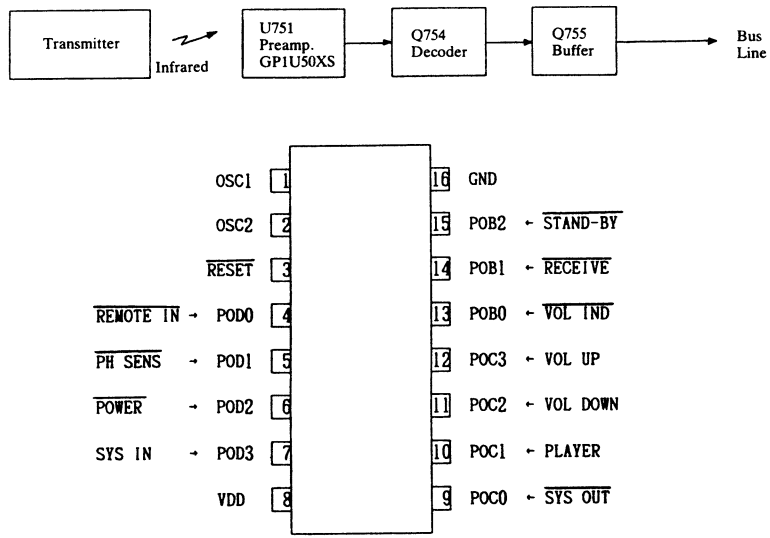
## Q703 LM7001 (PLL synthesizer and controller)




| Pin No. | Terminal | Description |
|---|---|---|
| 1 | XOUT | Connect to the 7.2 MHz crystal oscillator. |
| 2 | XIN | |
| 3 | CE | Chip enable terminal. Connect to the PLL terminal of μPD75108CW-B24 |
| 4 | CL | Serial clock input terminal. Connect to the CLOCK terminal of μPD75108CW-B24 |
| 5 | DATA | Serial data input terminal. Connect to the DATA terminal of μPD75108CW-B24 |
| 6 | $\overline{SYN}$ | Not used. |
| 7 | $\overline{AUTO/MONO}$ | AUTO/MONO selection output terminal. "L" when AUTO. |
| 8 | $\overline{FM}$ | FM band control output terminal. "L" when FM. |
| 9 | $\overline{AM}$ | AM band control output terminal. "L" when AM. |
| 10 | AMIN | AM local oscillator input terminal. |
| 11 | FMIN | FM local oscillator terminal. |
| 12 | $V_{DD}1$ | Power supply terminal for back-up. |
| 13 | $V_{DD}2$ | Power supply terminal. |
| 14 | PD1 | Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters. |
| 15 | PD2 | |
| 16 | Vss | Ground terminal. |



## Q754 μPD17103CX-522 (Remocon decoder)



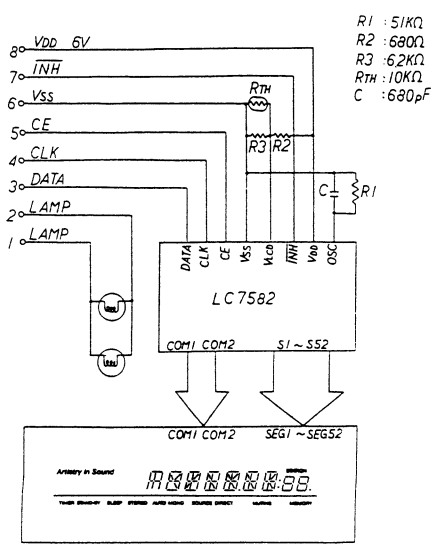

| Pin No. | Symbol | Terminal | Description |
|---|---|---|---|
| 1 | OSC1 | OSC | Connect to the 8.00MHz ceramic oscillator. |
| 2 | OSC2 | | |
| 3 | RES | $\overline{RESET}$ | System reset terminal. Active low. |
| 4 | POD0 | $\overline{REMOTE\ IN}$ | Signal input terminal from preamp. for remote control. Active low. |
| 5 | POD1 | PHONO SENES | Phono detection input terminal. Active low. |
| 6 | POD2 | POWER | Stand-by detection input terminal. During low input, only the POWER code is decoded. |
| 7 | POD3 | SYS IN | System code input terminal. |
| 8 | $V_{DD}$ | +B | Power supply terminal. |
| 9 | POC0 | $\overline{SYS\ OUT}$ | Output at this terminal are the custom code (16bits) remote control code input to REMOTE IN, data code (8bits), and the serial code (12bits) that has been converted corresponding to the decoded data code (8bits) |
| 10 | POC1 | PLAYER | When the player PLAY/REEJECT is input, a high pulse of 200ms is output. |
| 11 | POC2 | VOL DOWN | When the volume DOWN code is input, a high pulse of 120ms is output. |
| 12 | POC3 | VOL UP | When the volume UP code is input, a high pulse of 120ms is output. |
| 13 | POB0 | $\overline{VOL\ IND}$ | During the output of VOLUME UP/DOWN, a pulse ( ⎍T⎍T⎍T⎍T= 250ms) is output. (Not used.) |
| 14 | POB1 | $\overline{RECEIVE}$ | This is the display output for remote control reception. Output is low when decoded code is being recieved. |
| 15 | POB2 | $\overline{STAND\text{-}BY}$ | STAND-BY indication terminal. |
| 16 | $V_{SS}$ | GND | Ground terminal. |

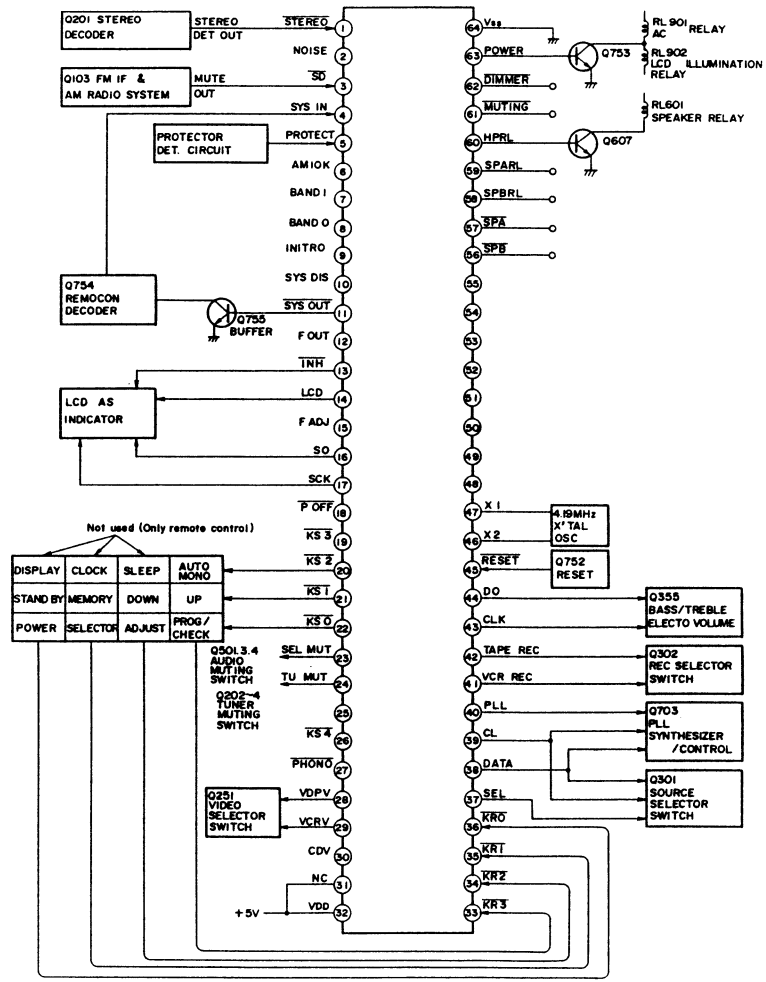
## Q751 μPD75108CW-B24 (Microprocessor)

| Pin No. | Function | Description |
|---|---|---|
| 1 | STEREO | Stereo broadcast detection input terminal.Low level when stereo broadcast. Control the stereo indicator into the LCD. |
| 2 | NOISE | Noise detection input terminal.High level when active.Control the stop of the auto tuning. |
| 3 | SD | Broadcast detection input terminal.Low level when active.Control the output TU MUT. |
| 4 | SYS IN | System code input terminal.High level when active. |
| 5 | PROTECT | Protection circuit operation detection input terminal.High level when active. |
| 6 | AM10K | Initial input terminal for AM band region setting. |
| 7 | BAND1 | Initial input terminal for FM band region setting. |
| 8 | BAND0 | |
| 9 | INITON | Initial input terminal for the positions of POWER/SELECTOR and step numbers of BASS/TREBLE. |
| 10 | SYS DIS | System code operation setting initial input terminal. |
| 11 | SYS OUT | System code output terminal.Low level when active. |
| 12 | FOUT | Crystal oscillator frequency adjustment output terminal.Adjustment mode when terminal FADJ is the high level. |
| 13 | INH | Output terminal which is connected to the terminal INH of LCD driver LC7582. |
| 14 | LCD | Output terminal which is connceted to the terminal CE of LCD driver LC7582. |
| 15 | FADJ | Adjustment mode input terminal of crystal oscillator.Adjustment mode when this terminal and +5V are connected.When this mode,the all segments of LCD are lighted. |
| 16 | SO | Output terminal which is connected to the terminal DATA of LCD driver LC7582. |
| 17 | SCK | Output terminal which is connected to the terminal CLK of LCD driver LC7582. |
| 18 | POFF | Input terminal for detection of the stoppage of electric current. Low level when the stoppage of electric current. |
| 19 | KS3 | Key scan output terminals. Low level when active. |
| 20 | KS2 | |
| 21 | KS1 | |
| 22 | KS0 | |
| 23 | SEL MUT | Muting output terminal when input selector is operated.High level when active. |
| 24 | TU MUT | Muting output terminal of tuner section.Higl level when active. |
| 25 | | Not used. |
| 26 | KS4 | Key scan output terminal.Low level when active. |
| 27 | PHONO | Phono control output terminal.Low level when the selector switch is PHONO. |
| 28 | VDPV | VDP video signal control output terminal.High level when the selector switch is VDP. |
| 29 | VCRV | VCR video signal control output terminal.High level when the selector switch is VCR. |
| 30 | CDV | CD video signal control output terminal.High level when the selector switch is CD. |
| 31 | NC | No connection. |
| 32 | $V_{DD}$ | Power supply terminal.Connect to +5V. |
| 33 | KR3 | Key input terminals. Low level when active. |
| 34 | KR2 | |
| 35 | KR1 | |
| 36 | KR0 | |

| Pin No. | Function | Description |
|---|---|---|
| 37 | SEL | Output terminal which is connected to the terminal CE of the function switch LC7822. |
| 38 | DATA | Output terminal which is connected to the terminal DI of the function switch LC7822 and terminal DATA of PLL synthesizer and controller LM7001. |
| 39 | CL | Output terminal which is connected to the terminal CL of the function switch LC7822 and terminal CL of PLL synthesizer and controller LM7001. |
| 40 | PLL | Output terminal which is connected to the termianl CE of PLL synthesizer and controller LM7001. |
| 41 | VCR REC | VCR recording signal control output terminal.High level when active. |
| 42 | TAPE REC | TAPE recording signal control output terminal.High level when active. |
| 43 | CLK | Output terminal which is connected to the terminal CLK of the electro volume LC7522. |
| 44 | DO | Output terminal which is connected to the terminal DI of the electro volume LC7522. |
| 45 | RESET | Reset input terminal.Low level when active. |
| 46 | X2 | Crystal oscillator connection terminal. |
| 47 | X1 | |
| 48-55 | | Not used. |
| 56 | SPB | Output terminal for speaker indication B.Low level when SPEAKER B. |
| 57 | SPA | Output terminal for speaker indication A.Low level when SPEAKER A. |
| 58 | SPBRL | Output terminal for speaker relay B.High level when on. |
| 59 | SPARL | Output terminal for speaker relay A.High level when on. |
| 60 | HPRL | Output terminal for headphone relay.High level when on. |
| 61 | MUTING | Muting indication output terminal.Low level when on. |
| 62 | DIMMER | DIMMER control output terminal.Low level when DIMMER. |
| 63 | POWER | Power control output terminal.High level when the power turns on. |
| 64 | Vss | Ground terminal. |

**LTTAE6111A (LCD ass'y)**

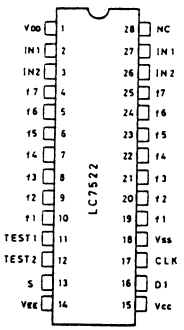


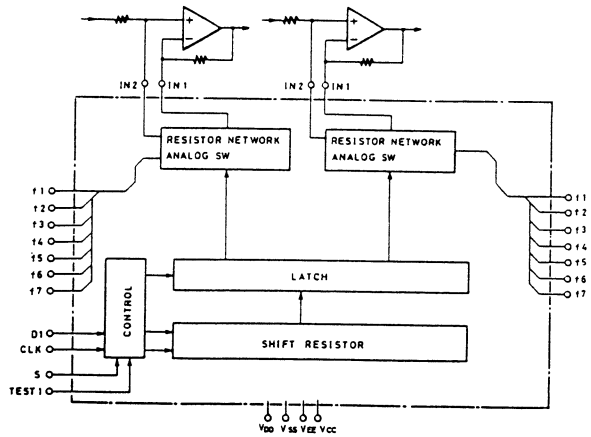




AM/FM band region setting

| BAND1 | BAND2 | AM10K | Region | Frequency range | | Scan step | |
|---|---|---|---|---|---|---|---|
| | | | | FM | AM | FM | AM |
| 1 | 1 | 1 | U.S.A. | 87.9-107.9MHz | 530-1710kHz | 200kHz | 10kHz |
| 0 | 1 | 0 | Europe | 87.50-108.00MHz | 522-1611kHz | 50kHz | 9kHz |
| 1 | 0 | 0 | Saudi Arabia | 87.50-108.00MHz | 531-1602kHz | 50kHz | 9kHz |
| 0 | 0 | 0 | Japan | 76.0-90.0MHz | 522-1611kHz | 100kHz | 9kHz |

Q355
LC7522 (Electro. Volume)




| PIN NO. | FUNCTION | DESCRIPTION |
|---|---|---|
| 1 | $V_{DD}$ | Power supply terminal for audio signal.Connect to +7V. |
| 2,27 | IN1 | Audio signal input terminal.Terminal IN1 is coneected to the inversion input of operation amplifier and terminal IN2 is connected to the non-inversion input of operation amplifier. |
| 3,26 | IN2 | |
| 4-10<br>25-19 | f1-f7 | Connection terminals of band pass filter.<br>Terminals f1 and f3 are used to the high frequency and f2 and f4 are used to the low frequency. |
| 11 | TEST1 | IC test terminals. |
| 12 | TEST2 | |
| 13 | S | Selector terminal when used two chips. |
| 14 | $V_{EE}$ | Power supply terminal for audio signal.Connect to -7V. |
| 15 | Vcc | Power supply terminal.Connect to +5V. |
| 16 | DI | Data input terminal for the microprocessor. |
| 17 | CLK | Clock input terminal for the microprocessor. |
| 18 | Vss | Ground terminal. |



# ADJUSTMENT PROCEDURES

**Preparation**

**• Input**

FM mono: 1kHz, 75kHz devi., 60dB/$\mu$V
FM stero: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.
AM: 400Hz, 30% mod.,

**• Output**

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

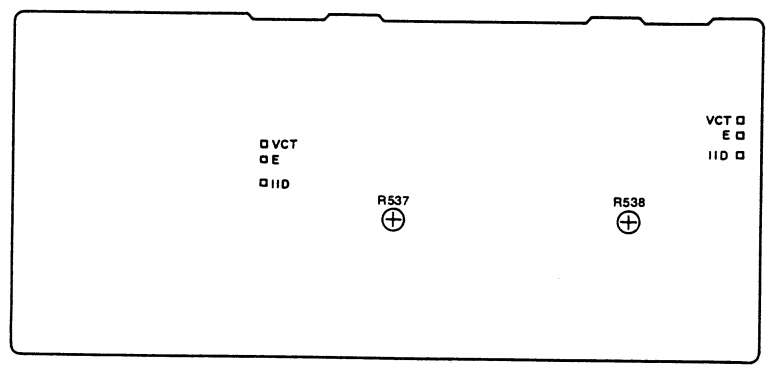
**• Standard knob position**

Input selector ..... CD
MUTING ..... OFF
VOLUME ..... Maximum
BASS/TREBLE ..... 0

**Amplifier section**

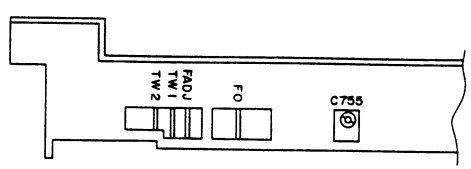
**Idling current adjustment**

Connect the DC voltmeter to the terminals $I_{ID}$ and $V_{CT}$ on the main amplifier pc board.
Adjust the semi-fixed resistors R537 and R538 so that the indication of voltmenter is 3.5±0.5mV.
Notes: VOLUME ..... Maximum, Open load,
Adjust after switching on for 5 minutes.




**Clock Frequency adjustment**

Remove the top cover and front panel.
Set the input selector switch to FM.
Set the tuning to 98.00MHz.
Short between terminals TW1 and FADJ with the short clip, and connect the frequency counter to terminal FO.
Adjust C751 so that the counter reading becomes 1,048,578 ±3Hz.
After adjustment, disconnect the short clip and frequency counter.

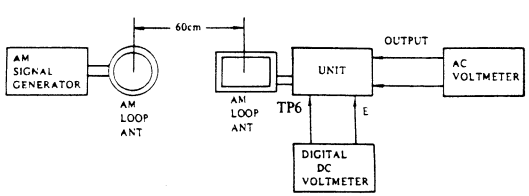


## FM section

| Item | Step | Connection of instrument | FM SG output | Stereo modulator output | Turning dial setting | Output indicator | Adjustment | Adjust for | Remarks |
|---|---|---|---|---|---|---|---|---|---|
| FM IF | 1 | Fig. 1 | 98.00MHz 1kHz, 75kHz devi. 65dBf (60dB) | – | 98.00MHz | DC voltmeter | L101 | 0V ± 30mV | Mode switch: MONO Repeat the steps 1 and 2 until no further adjustment is necessary |
| | 2 | | | | | Distortion analyzer | L102 | Minimum | |
| TUNED indicator level | 1 | Fig. 3 | 98.00MHz 19.2dBf (14dB) | – | 98.00MHz | Oscilloscope | R101 | Output | Mode switch: STEREO Remove R102 when this adjustment can not. |
| | 2 | | 98.00MHz 18.2dBf (12dB) | | | | | No output | |
| VCO | | Fig. 2 | 98.00MHz 1kHz, 75kHz devi. 65dBf (60dB) | – | 98.00MHz | Frequency counter | R201 | 19kHz ± 10Hz | Mode switch STEREO |
| Stereo Distortion | | Fig. 3 | 98.00MHz 65dB (60dB) Ext. modulation | L or Rch. 1kHz | 98.00MHz | Distortion analyzer | IF on the front end | Minimum | Don't turn more than ±180° |
| Stereo Separation | 1 | Fig. 3 | 98.00MHz 65dBf (60dB) Ext. modulation | Lch. 1kHz | 98.00MHz | Rch. AC voltmeter | R202 | Minimum | Maximum and same separation |
| | 2 | | | Rch. 1kHz | | Lch. AC voltmeter | | Minimum | |

## AM section

| Step | AM SG output | Tuned frequency | Output indicator | Adjustment point | Adjust for |
|---|---|---|---|---|---|
| 1 | | 522kHz | Digital DC voltmeter | OSC on RF block (L151) | 1.3V ± 0.1V |
| 2 | 603kHz 400Hz 30% mod. 60dB/m | 603kHz | AC voltmeter | RF on RF block (L151) | Maximum |
| 3 | 999kHz 400Hz 30% mod. 60dB/m | 999kHz | AC voltmeter | L152 | Maximum & TUNED indicator lights on |




Reference specifications

| | |
|---|---|
| FM Tuned voltages | 87.50MHz 1.5 ± 0.5V |
| | 108.00MHz 7.8 ± 0.5V |
| Auto stop level | AM: Less than 68dB/m |
| | FM: Less than 18 dBμ |
| AM Tuned voltage | 522kHz 1.3 ± 0.5V |
| | 1611kHz 6.9 ± 0.5V |

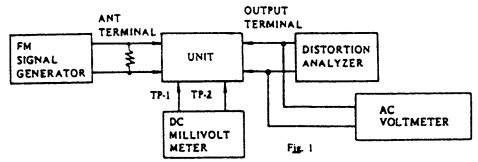
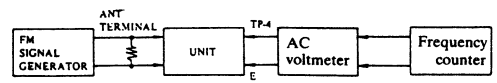



Fig. 1




Use the high impedance probe. (10 : 1)

Fig. 2

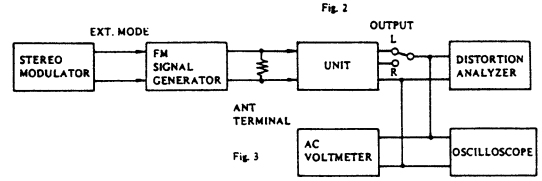
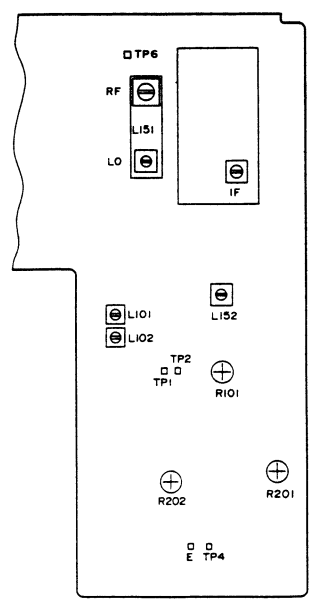



Fig. 3



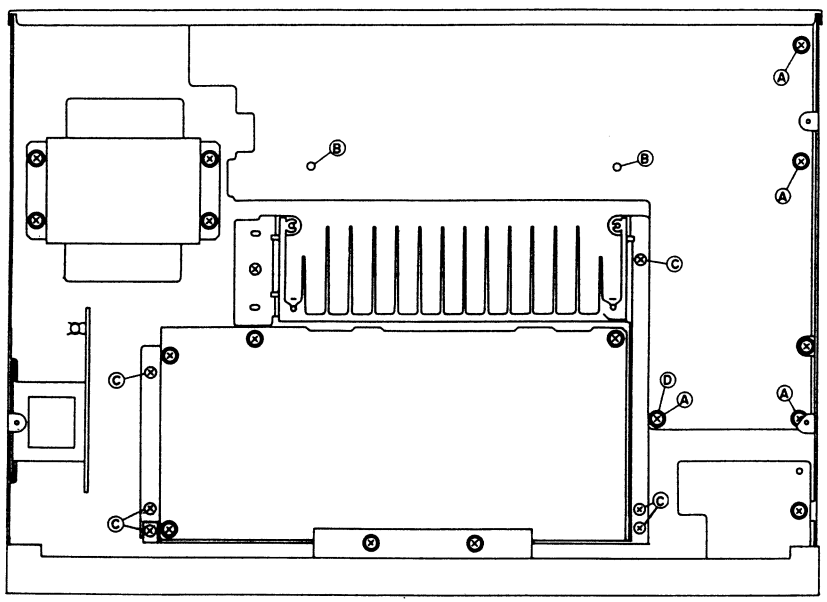
# DISASSEMBLING PROCEDURES

**1. Checking the main circuit pc board**

① Remove the top cover and front panel.
② Remove the four screws holding the back panel and the chassis.
③ Remove the four screws A as shown below holding the chassis and the main pc board.
④ Remove the main pc board from two holder B.
⑤ Lift up the back panel and check the main pc board.

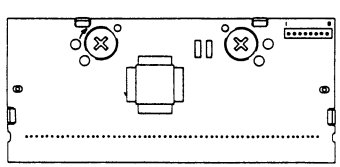
**2. Checking the main amplifier pc board.**

① Remove the top cover and front panel.
② Remove the six screws C as shown below.
③ Remove a screw D as shown below.
④ Cut the two binders of right side of radiator.
⑤ Lift up the main amplifier pc board.




## Replacing the lamp for LCD.

Replacing the lamp for LCD.
Turn 90° to the clockwise direction with screwdriver.
Part No. 210197





# PRINTED CIRCUIT BOARD-PARTS LIST

### HEADPHONE PC BOARD(NAETC-3815-2)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| R581, R582 | 441623914 | 390ohm, 1W, Metal oxide film resistors |
| P503 | 25045232 | HLJ4307-01-3140, Headphone terminal |

### OPERATION SWITCH PC BOARD(NASW-3817-2)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| S751-S757 | 25035548 | NPS-111-S510, Push switches |
| P752 | 2000782 | NSAS-14P738, Socket |

### DIGITAL CIRCUIT PC BOARD(NADG-3818-2A/2B)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Remocon sensor** | |
| U751 | 24130003 | GP1U50XS |
| | **Transistors** | |
| Q501, Q755 | 2212600 | DTA124ES |
| Q752 | 221282 | DTC144ES |
| Q753 | 2211952 | 2SK1472K-B |
| | **ICs** | |
| Q751 | 22240323 | μPD75108CW-B24 |
| Q754 | 22240338 | μPD17103CX-522 |
| | **Diodes** | |
| D751 | 223163 | 1SS133 |
| D754-D761 | 223163 | 1SS133 |
| D762 | 224450562 | MTZ5.6B |
| | **Osc elements** | |
| X751 | 3010121A | XTL-4.19M, X'tal |
| X752 | 3010154 | CST8.00MT, Ceramic |
| | **Capacitors** | |
| C751 | 353741009 | 10μF, 16V, Elect. |
| C752 | 3000057 | 0.1F, 5.5V, Super |
| C755 | 3060024 | NTC-30P21, Trimmer |
| C756 | 353780109 | 1 μF, 50V, Elect. |
| C757 | 353742209 | 22μF, 16V, Elect. |
| C758 | 353721019 | 100 μF, 6.3V, Elect. |
| | **Resistors** | |
| R735 | 49163473404 | 47kohm×4, 1/10W, Network |
| R763 | 49163103404 | 10kohm×4, 1/10W, Network |
| | **Switches** | |
| S758, S759 | 25035548 | NPS-111-S510 |
| | **Socket** | |
| P751 | 2000608 | NSAS-16P564 |
| | **Plug** | |
| P752A | 25055188 | NPLG-7P172 |

### VIDEO SELECTOR CIRCUIT PC BOARD(NAETC-3819-2)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q251 | 222840661 | 4066B |
| | **Transistors** | |
| Q252 | 2213074 or 2211455 | 2SA933-R or 2SA1015-GR |
| Q253-Q256 | 2211183 or 2211255 | 2SC1740-R or 2SC1815-GR |
| | **Capacitors** | |
| C251, C252 | 354741009 | 10μF, 16V, Elect. |
| C254, C255 | 354724719 | 470 μF, 6.3V, Elect. |
| C256 | 354764709 | 47μF, 35V, Elect. |
| | **Terminal** | |
| P251 | 25045216 | NPJ-4PDBL94 |

### VOLUME CIRCUIT PC BOARD(NAETC-3821-2)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| Q391 | 22240322 | LB1639, IC |
| C391 | 354741019 | 100 μF, 16V, Elect. capacitor |
| R391, R392 | 5104261 | N16RGM50KA25F, Variable resistor |
| P351 | 2000931 | NSAS-6P884, Socket |
| P501a | 25055134 | NPLG-4P118, Plug |

### TONE CONTROL PC BOARD(NAAF-3822-2A)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **ICs** | |
| Q351-Q353 | 22240273 | NJM4565SD |
| Q355 | 22240219 | LC7522 |
| | **Diodes** | |
| D351, D352 | 224450683 | MTZ6.8C |
| | **Capacitors** | |
| C351, C352 | 391780229 | 2.2 μF, 50V, Elect.(HWQ) |
| C353, C354 | 373302214 | 220pF ±5%, 125V, PP |
| C355-C358 | 373301014 | 100pF ±5%, 125V, PP |
| C359, C360 | 391780229 | 2.2 μF, 50V, Elect.(HWQ) |
| C361, C362 | 379121034 | 0.01μF ±5%, 50V, DEW |
| C363, C364 | 391741009 | 10μF, 16V, Elect.(HWQ) |
| C365, C366 | 379124734 | 0.047 μF ±5%, 50V, DEW |
| C367, C368 | 373301014 | 100pF ±5%, 125V, PP |
| C369, C370 | 354741009 | 10μF, 16V, Elect. |
| C374, C375 | 354741009 | 10μF, 16V, Elect. |
| | **Plugs** | |
| P371 | 25055319 | NPLG-5P302 |
| P372 | 25055320 | NPLG-6P303 |

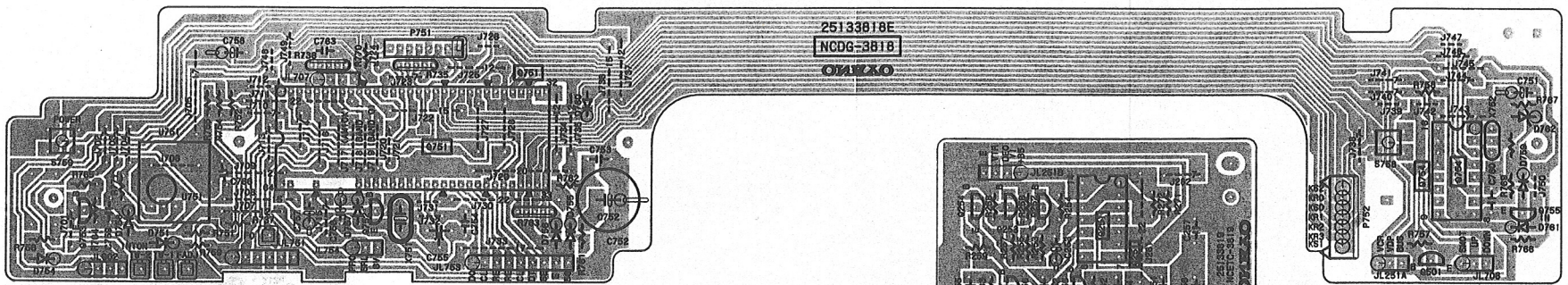
### EQUALIZER AMPLIFIER PC BOARD(NAAF-3823-2A)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **IC** | |
| Q071 | 22240191 | NJM4565D-D |
| | **Capacitors** | |
| C071, C072 | 391780229 | 2.2 μF, 50V, Elect.(HWQ) |
| C077, C078 | 354721019 | 100 μF, 6.3V, Elect. |
| C079, C080 | 371126224 | 6200pF±5%, 50V, Mylar |
| C081, C082 | 371121824 | 1800pF±5%, 50V, Mylar |
| C083, C084 | 391780229 | 2.2 μF, 50V, Elect.(HWQ) |
| C085, C086 | 354742219 | 220 μF, 16V, Elect. |
| | **Plug** | |
| P071 | 25055334 | NPLG-9P317 |

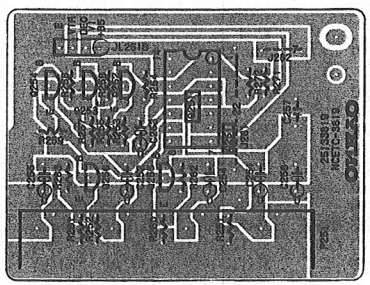
### BAND STEP PC BOARD(NASW-3834-2) (Only Woirdwide model)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| S781 | 25065267 | NSS-22109, Slide switch |

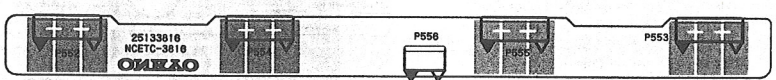
# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



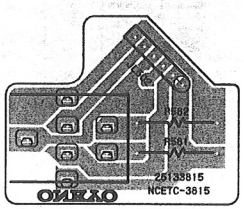

DIGITAL CIRCUIT PC BOARD



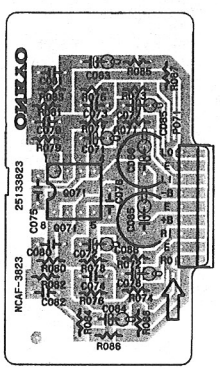
VIDEO SELECTOR CIRCUIT PC BOARD



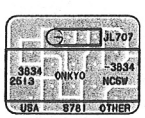

HOLDER PC BOARD



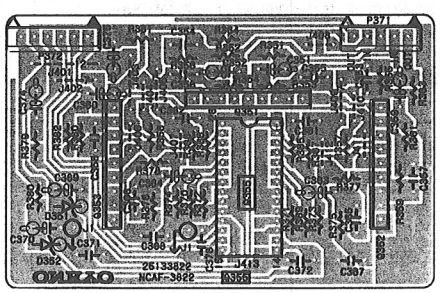

HEADPHONE PC BOARD



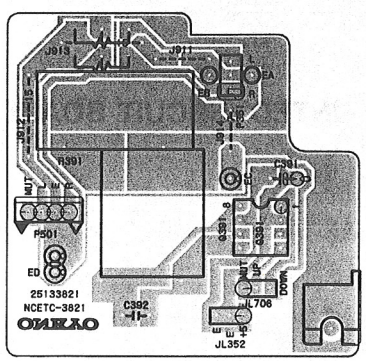

EQUALIZER AMPLIFIER PC BOARD



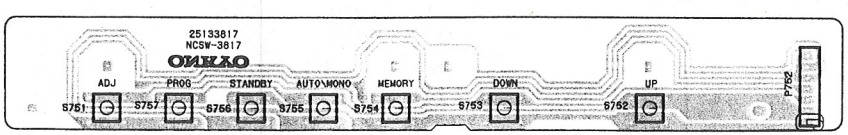

BAND STEP PC BOARD




TONE CONTROL PC BOARD




VOLUME CIRCUIT PC BOARD




OPERATION SWITCH PC BOARD

## TUNER CIRCUIT PC BOARD(NARF-3813-2A/2B)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Front end** | |
| U001 | 240074A | FE407-G25 |
| | **Transitors** | |
| Q101 | 2210746 | 2SC945A-P |
| Q102 | 2211723 | 2SC1923-O |
| Q131 | 2211255 | 2SC1815-GR |
| Q202 | 2211455 or | 2SA1015-GR or |
| | 2213354 | 2SA933S-R |
| Q203, Q204 | 2212794 | 2SD1468-R |
| Q607 | 2211255 or | 2SC1815-GR or |
| | 2210746 | 2SC945A-P |
| Q701 | 2211255 | 2SC1815-GR |
| Q702 | 2212445 | 2SK365-GR |
| Q704, Q705 | 2213090 | DTA114YS |
| | **ICs** | |
| Q103 | 22240039 | LA1266 |
| Q201 | 22240242 | AN7470 |
| Q301 | 22240270 | LC7822N |
| Q302 | 22240309 | TC9214P |
| Q703 | 22240090 | LM7001 |
| Q931 | 222780125NEC | 78M12HF |
| Q932, Q933 | 222780055NEC | 78M05HF |
| | **Diodes** | |
| D131, D132 | 223132 | 1K60 |
| D201, D603 | 223163 | 1SS133 |
| D914-D917 | 22380035 | GP104003E |
| D931-D935 | 22380035 | GP104003E |
| D936, D938 | 223163 | 1SS133 |
| D937 | 224450623 | MTZ6.2C |
| | **Transformers** | |
| L101 | 233401 | NFIF-4072 |
| L102 | 233402 | NFIF-4073 |
| L152 | 232139 | NMIF-4062 |
| | **RF block** | |
| L151 | 232148 | NMRF-7050 |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Coils** | |
| L001 | 233312 | NFA-3051 |
| L103 | 233383 | NMC-6070 |
| L201, L202 | 233355A | NMC-4059 |
| L251 | 233409K220 | NCH1284 |
| L501, L502 | 231134 | S-0.8E |
| | **Ceramic filters** | |
| X101-X103 | 3010137 | SFE10.7MMK |
| X151 | 3010123 | SFZ450JL |
| X152 | 3010076 | BFU450C |
| | **X'tal** | |
| X701 | 3010141 | XTL-7.2M |
| | **Capacitors** | |
| C002 | 354741009 | 10μF, 16V, Elect. |
| C107, C132 | 354742209 | 22μF, 16V, Elect. |
| C109 | 354780109 | 1 μF, 50V, Elect. |
| C113 | 354780339 | 3.3 μF, 50V, Elect. |
| C131 | 354784799 | 0.47μF, 50V, Elect. |
| C152 | 354741019 | 100 μF, 16V, Elect. |
| C154 | 354780479 | 4.7 μF, 50V, Elect. |
| C155, C156 | 354741009 | 10μF, 16V, Elect. |
| C157, C201 | 371124734 | 0.047 μF ±5%, 50V, Mylar |
| C158 | 371122234 | 0.022 μF ±5%, 50V, Mylar |
| C202 | 354742209 | 22μF, 16V, Elect. |
| C203 | 354744719 | 470 μF, 16V, Elect. |
| C205, C206 | 371121224 | 1200pF±5%, 50V, Mylar <G> |
| | 371121524 | 1500pF±5%, 50V, Mylar <W> |
| C208, C209 | 354741009 | 10μF, 16V, Elect. |
| C210 | 370134714 | 470pF ±5%, 100V, APS |
| C211 | 354780109 | 1 μF, 50V, Elect. |
| C212 | 354780339 | 3.3 μF, 50V, Elect. |
| C213 | 354782299 | 0.22μF, 50V, Elect. |
| C215, C216 | 354742209 | 22μF, 16V, Elect. |
| C217 | 354784799 | 0.47μF, 50V, Elect. |
| C301-C312 | 373301014 | 100pF ±5%, 125V, PP |
| C331-C333 | 354780339 | 3.3 μF, 50V, Elect. |
| C336 | 379122234 | 0.022 μF ±5%, 50V, DEW |

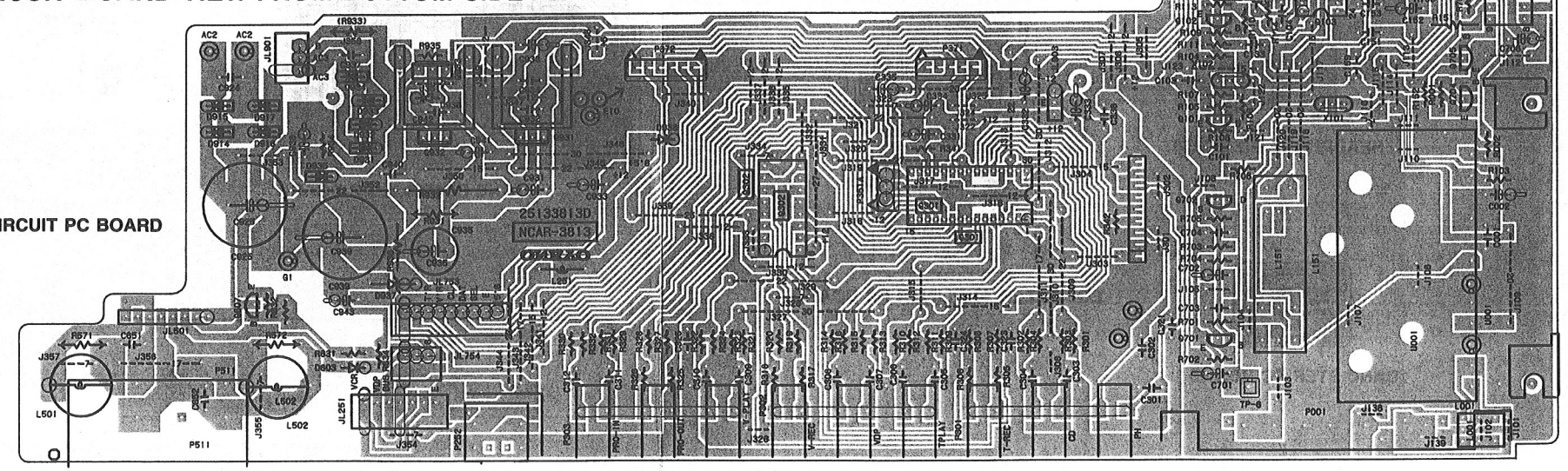
| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| C701 | 354782299 | 0.22μF, 50V, Elect. |
| C702 | 354780229 | 2.2 μF, 50V, Elect. |
| C703, C704 | 371121034 | 0.01μF ±5%, 50V, Mylar |
| C706 | 354722219 | 220 μF, 6.3V, Elect. |
| C924, C937 | 379131035 | 0.01μF ± 10%, 100V, DEW |
| C925 | 354762229 | 2200μF, 35V, Elect. |
| C931, C935 | 354761019 | 100 μF, 35V, Elect. |
| C933 | 354741019 | 100 μF, 16V, Elect. |
| C936 | 354741009 | 10μF, 16V, Elect. |
| C938 | 354761019 | 100 μF, 35V, Elect. |
| C939 | 354742229 | 2200μF, 16V, Elect. |
| C941 | 354741009 | 10μF, 16V, Elect. |
| C943 | 354722219 | 220 μF, 6.3V, Elect. |
| | **Resistors** | |
| R101 | 5210070 or | N06HR100KBD, |
| | 5210221 | Semi-fixed |
| R201 | 5210062 or | N06HR4.7KBD or |
| | 5210216 | N06HR5KBD, Semi-fixed |
| R202 | 5210074 or | N06HR470KBC or |
| | 5210224 | N06HR500KBD, Semi-fixed |
| R931 | 442521004 | 10ohm, 1/2W, Metal oxide film |
| R932 | 441721014 | 100ohm, 2W, Metal oxide film |
| | **Terminals** | |
| P001 | 25060087 | NTM-2PDMN31, Antenna |
| P252 | 25045172 | HSJ1003-01-020, RI |
| P301 | 25045252 | NPJ-6PDBL124 |
| P302, P303 | 25045213 | NPJ-6PDBL92 |
| P511 | 25060147 | NTM-4PDMN075 |
| | **Plug** | |
| P351A | 25055133 | NPLG-3P117 |
| | **Sockets** | |
| JL251 | 25050271 | NSCT-7P99 |
| JL352 | 25050267 | NSCT-3P95 |
| JL751 | 25050270 | NSCT-6P98 |
| JL753 | 25050273 | NSCT-9P101 |
| JL754, JL901 | 25050267 | NSCT-3P95 |
| | **Radiator** | |
| | 27160211 | RAD-68 |

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Bracket** | |
| | 27141059 | Ground |
| | **Shield plate** | |
| | 27150298A | |

NOTE: <G>: Only 220/240V models
<W>: Only Worldwide model

## PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

TUNER CIRCUIT PC BOARD

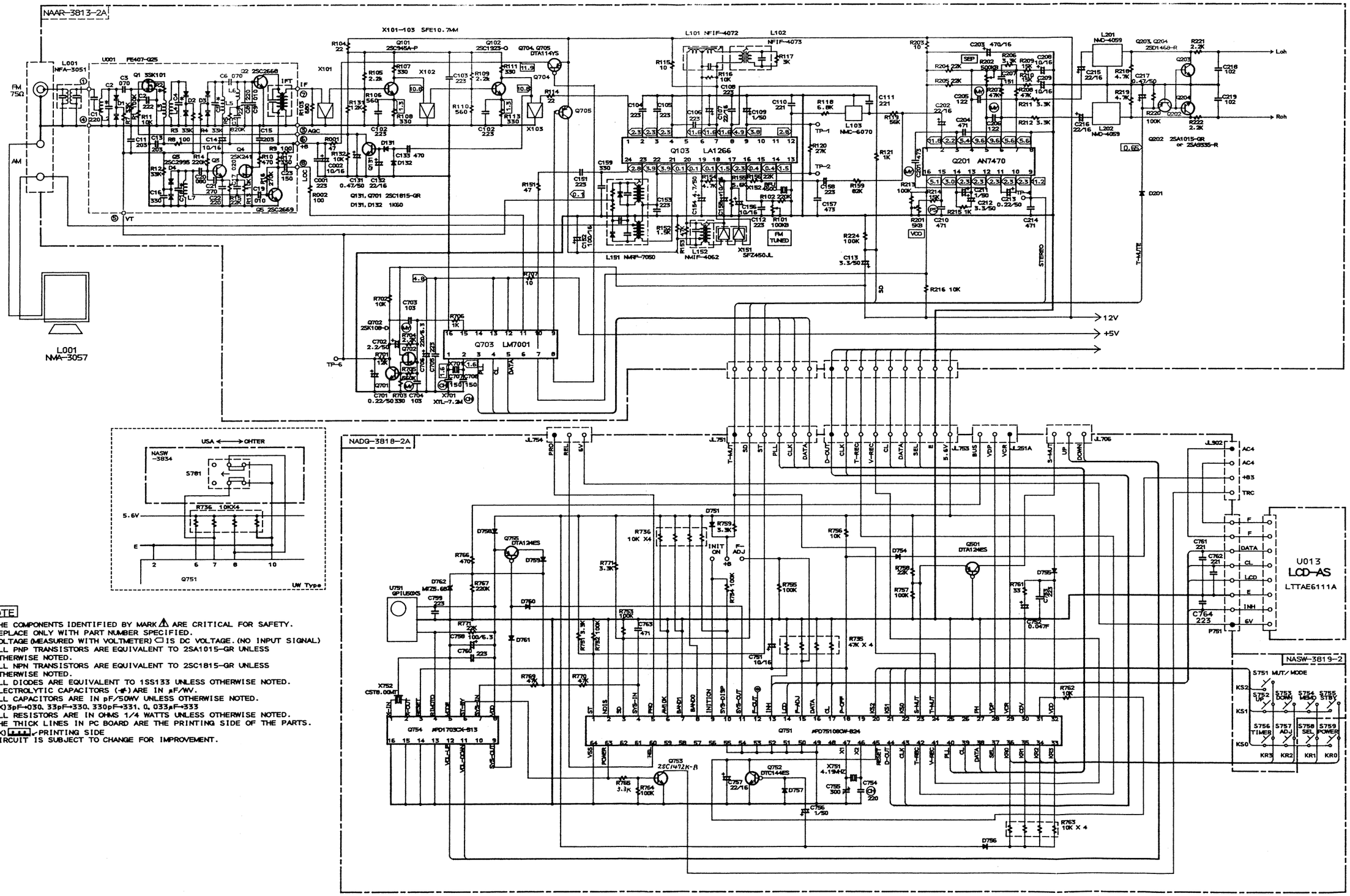


# SCHEMATIC DIAGRAM

A B C D E F G

1 2 3 4 5

– TUNER SECTION –




NOTE

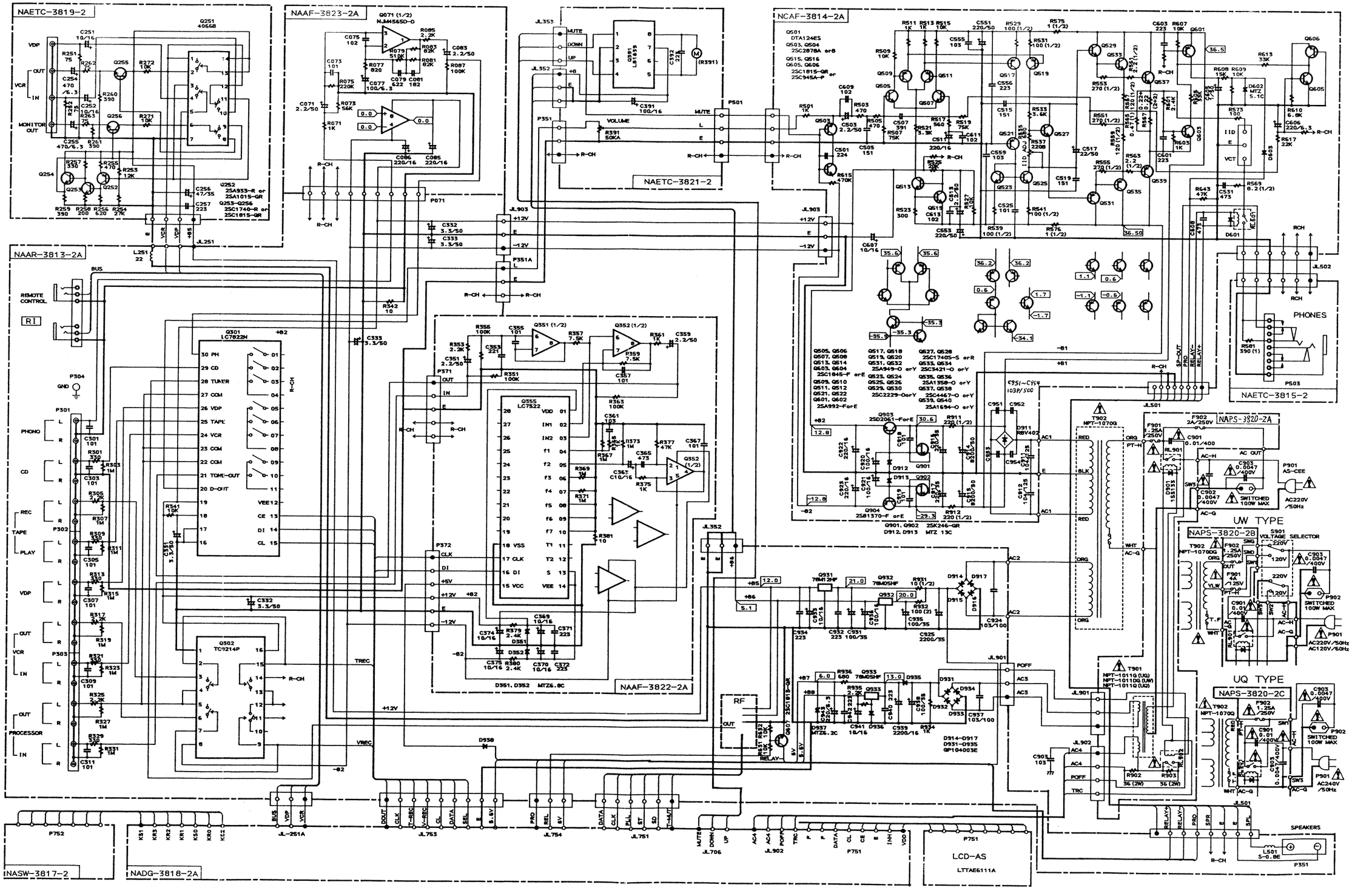
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) ▭ IS DC VOLTAGE. (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (-#) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX) 3pF→030, 33pF→330, 330pF→331, 0.033μF→333
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▬▬ ↙ PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

# SCHEMATIC DIAGRAM

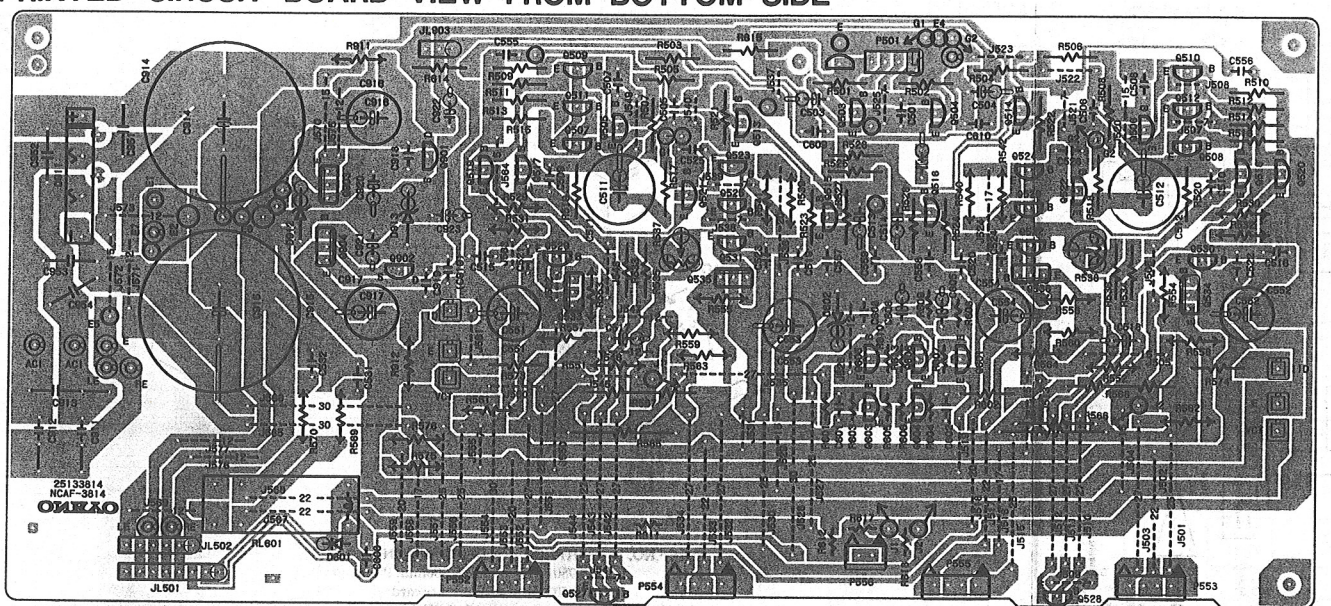
A B C D E F G

1 2 3 4 5

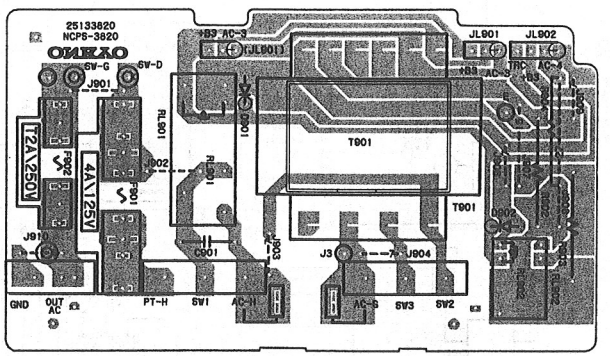
## – AMPLIFIER SECTION –



# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE




MAIN AMPLIFIER PC BOARD




POWER SUPPLY CIRCUIT PC BOARD

# PRINTED CIRCUIT BOARD-PARTS LIST

## MAIN AMPLIFIER PC BOARD (NAAF-3814-2A)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Transistors** | |
| Q503, Q504 | 2212285 or 2212286 | 2SC2878-A or 2SC2878-B |
| Q505-Q508 | 2211732 or 2211733 | 2SC1845-F or 2SC1845-E |
| Q509-Q512 | 2211792 or 2211793 | 2SA992-F or 2SA992-E |
| Q513, Q514 | 2211732 or 2211733 | 2SC1845-F or 2SC1845-E |
| Q515, Q516 | 2211255 or 2210746 | 2SC1815-GR or 2SC945A-P |
| Q517-Q520 | 2211353 or 2211354 | 2SA949-O or 2SA949-Y |
| Q521, Q522 | 2211792 or 2211793 | 2SA992-F or 2SA992-E |
| Q523-Q526 | 2211633 or 2211634 | 2SC2229-O or 2SC2229-Y |
| Q527, Q528 | 2213285 or 2213284 | 2SC1740S-S or 2SC1740S-R |
| Q529, Q530 | 2211633 or 2211634 | 2SC2229-O or 2SC2229-Y |
| Q531, Q532 | 2211353 or 2211354 | 2SA949-O or 2SA949-Y |
| Q533, Q534 | 2212653 or 2212654 | 2SC3421-O or 2SC3421-Y |
| Q535, Q536 | 2212643 or 2212644 | 2SA1358-O or 2SA1358-Y |
| Q537, Q538 | 2202253 or 2202254 | ☆2SC4467-O or ☆2SC4467-Y |
| Q539, Q540 | 2202243 or 2202244 | ☆2SA1694-O or ☆2SA1694-Y |
| Q601 | 2211792 or 2211793 | 2SA992-F or 2SA992-E |
| Q603, Q604 | 2211732 or 2211733 | 2SC1845-F or 2SC1845-E |
| Q605, Q606 | 2211255 or 2210746 | 2SC1815-GR or 2SC945A-P |
| Q901, Q902 | 2211945 | 2SK246-GR |
| Q903 | 2202116 or 2202115 | 2SD2061-F or 2SD2061-E |
| Q904 | 2202176 or 2202175 | 2SB1370-F or 2SB1370-E |
| | **Diodes** | |
| D601 | 223163 | 1SS133 |
| D602 | 224450513 | MTZ5.1C |
| D911 | 22380022 | RBV402 |
| D912, D913 | 224451303 | MTZ13C |
| | **Capacitors** | |
| C501 | 374722244 | 0.22μF ±5%, 50V, TF |
| C503, C504 | 393081007 | 10μF, 50V, Elect.(ARE) |
| C505, C506 | 373301514 | 150pF ±5%, 125V, PP |
| C507, C508 | 373303914 | 390pF ±5%, 125V, PP |
| C511, C512 | 393044717 | 470 μF, 16V, Elect.(ARE) |
| C513, C514 | 354780229 | 2.2 μF, 50V, Elect. |
| C515, C516 | 373301514 | 150pF ±5%, 125V, PP |
| C517, C518 | 354782209 | 22μF, 50V, Elect. |
| C519, C520 | 373301514 | 150pF ±5%, 125V, PP |
| C525, C526 | 373301014 | 100pF ±5%, 125V, PP |
| C531, C532 | 373734734 | 0.047 ±5%, 100V, MKT |
| C551-C554 | 354782219 | 220 μF, 50V, Elect. |
| C555, C556 | 373732234 | 0.022 ±5%, 100V, MKT |
| C559 | 373731034 | 0.01±5%, 100V, MKT |
| C605 | 354780109 | 1 μF, 50V, Elect. |
| C606 | 354722219 | 220 μF, 6.3V, Elect. |
| C608 | 374724734 | 0.047 μF ±5%, 50V, TF |
| C609-C614 | 372121024 | 1000pF±5%, 50V, Styrole |
| C911, C912 | 374501045 | 0.1 ±10%, 125V, ME |
| C914, C915 | 3504239 | 8200μF, 50V, Elect. |
| C916, C917 | 354762219 | 220 μF, 35V, Elect. |
| C918, C919 | 373631014 | 100pF ±5%, 100V, KP |
| C920, C921 | 354741019 | 100 μF, 16V, Elect. |
| C922, C923 | 354742219 | 220 μF, 16V, Elect. |
| | **Resistors** | |
| R529-R532 | 442521014 | 100ohm, 1/2W, Metal oxide film |
| R537, R538 | 5210054 or 5210210 | N06HR220BD or N06HR200BD, Semi-fixed |
| R539-R542 | 442521014 | 100ohm, 1/2W, Metal oxide film |
| R551-R556 | 442522714 | 270ohm, 1/2W, Metal oxide film |
| R557-R560 | 442521214 | 120ohm, 1/2W, Metal oxide film |
| R561-R564 | 442520224 | 2.2ohm, 1/2W, Metal oxide film |
| R565, R566 | 441624794 | 0.47ohm, 1W, Metal oxide film |
| R567, R568 | 4500027 | 0.22ohm, 2W, Metal plate |
| R569, R570 | 442520824 | 8.2ohm, 1/2W, Metal oxide film |
| R575, R576 | 442520104 | 1ohm, 1/2W, Metal oxide film |
| R911, R912 | 442522214 | 220ohm, 1/2W, Metal oxide film |
| | **Relay** | |
| RL601 | 25065339 | NRL-2P5A-DC24-046 |
| | 27262525 | Plate, relay(on the relay RL601) |
| | 29110082 | Adhesive tape for plate, relay |
| | **Socket** | |
| P501 | 2009990065 | NSAS-8P0101 |
| | **Plugs** | |
| P552-P555 | 25055456 | NPLG-4P438 |
| | **Cord ass'y** | |
| | 2020091 | |

CAUTION: Replacement for transistor of mark ☆, if necessary, must be made from the same beta group ($H_{FE}$) as the original type.

Ex. 2SC4467-O 2SA1694-O

Same beta group

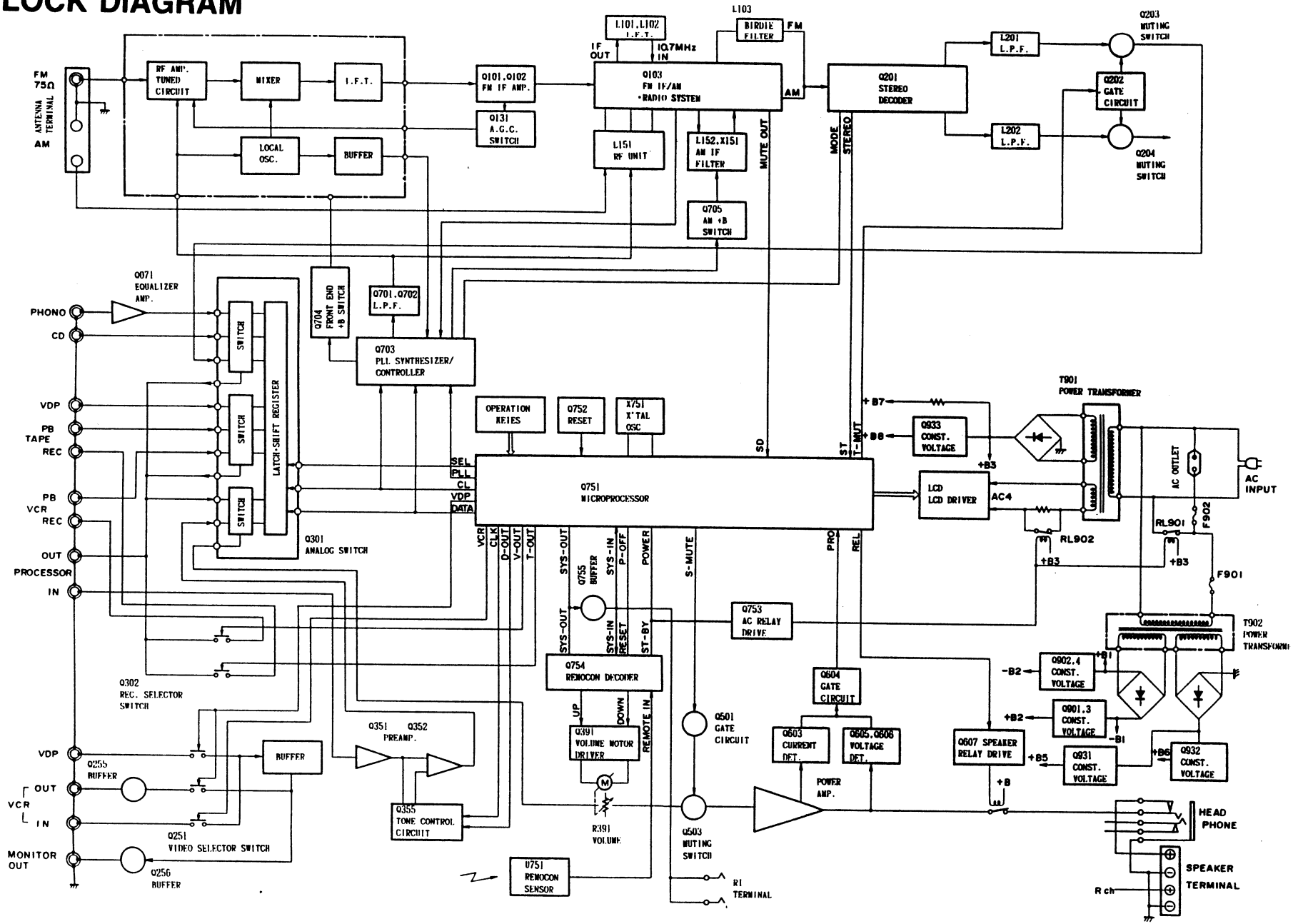
## POWER SUPPLY CIRCUIT PC BOARD(NAPS-3820-2A/2B/2C)

| CIRCUIT NO. | PART NO. | DESCRIPTION |
|---|---|---|
| | **Diode** | |
| D901 | 2223163 | 1SS133 |
| | **Transformer** | |
| T901 | ⚠ 2300467 | NPT-1011G, Power <G> |
| | ⚠ 2300469 | NPT-1011DG, Power <W> |
| | ⚠ 2300484 | NPT-1011Q, Power <Q> |
| | **Capacitor** | |
| C901 | ⚠ 3500065A | 0.01μF, AC400V/125V, IS |
| | **Cover** | |
| C901a | ⚠ 27301216 | For C901 <G> |
| | **Resistors** | |
| R902, R903 | 441723604 | 36ohm, 2W, Metal oxide film |
| | **Relaies** | |
| RL901 | ⚠ 25065248 | NRL-1P15A-DC12-29 |
| RL902 | ⚠ 25065391 | NRL-1P2A-DC12-065 |
| | **Fuseholders** | |
| F901a | ⚠ 250113 | SN5051 <W> |
| | ⚠ 25050065 | YSH403T <G/Q> |
| F902a | ⚠ 25050065 | YSH403T <G/W> |
| | **Insulated palte** | |
| | 28175137 | |
| | **Rating label** | |
| | 29360606 | T1.25A/250V, For F901<G/Q> |
| | 29360606 | T1.25A/250V, For F902 <W> |
| | **Fuses** | |
| F901 | 252049 | 4A(ST-6), Primary <W> |
| | 252071 | 1.25A-SE-EAK, Primay <G/Q> |
| F902 | 252074 | 2A-SE-EAK, Outlet <G> |
| | 252071 | 1.25A-SE-EAK, Primary <W> |

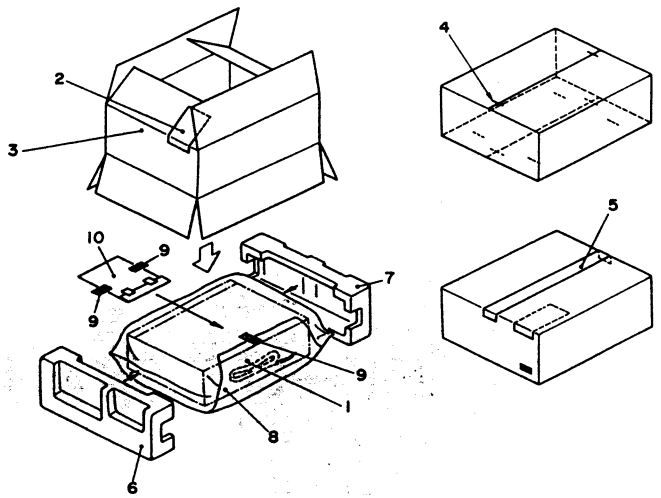
NOTE: <G> Only 220V model
<Q> Only 240V model
<W> Only Worldwide model

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

# BLOCK DIAGRAM



## PACKING VIEW




| REF.NO. | PART NO. | DESCRIPTION |
|---|---|---|
| 1 | 29095012-1 | 500 ×800mm, Protection sheet |
| 2 | 29365020B | Warranty card |
| | | <Only West Germany model> |
| | 29100094A | Poly-vinyl bag for warranty card |
| 3 | 29052065 | Master carton box |
| 4 | 282301 | Sealing hook |
| 5 | 29110071-1 | Damplon tape |
| 6 | 29091285C | Pad R |
| 7 | 29091284B | Pad L |
| 8 | 29100036A | 550 ×850mm, Poly-vinyl bag |
| 9 | 261504 | Adhesive tape |
| 10 | Accessary bag ass'y | |
| | 29341519 | Instruction manual |
| | 292092 | FM antenna |
| | 232140 | NMA-3057, AM loop antenna |
| | 24140174 | RC-174S, Remote control transmitter |
| | 3010054 | Two batteries |
| | 29100097 | 350 ×250mm, Poly-vinyl bag |
| | 29365024 | Warranty card <Only French model> |
| | 29100107 | Poly-vinyl bag for warranty card |
| | 25055040 | CV-K-2, Conversion plug |
| | | <Only Wolrdwide model> |
| | 25060123 | YAE21-0120A, FM antenna adaptor |
| | | <Only Worldwide and Australian models> |

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